2.5 Antenna

To meet the FCC's RF Exposure Guidelines, the main transmitter antenna should:

- be installed to ensure a 7.9 in/20cm minimum distance between the body of the user or nearby persons and the antenna.

-have the antenna gain less cable loss which does not exceed 2.7dBi.

2.5.1 Recommended tools and supplies

- circle cutter
- hole saw or
- socket punch for antenna
- Mini-UHF Crimp tool

2.5.2 Planning

Gemini^{PD} commonly uses three separate antennas:

- Main transceiver – constraints are MPE limits and omni-directional factors
- Auxiliary receiver – constraints are diversity spacing and omni-directional requirements
- GPS – constraints are TX spacing and clear sky view.

For ground-plane dependent antennas – the center of metal surface is preferable for best omni-directional pattern.

For ground-plane independent antennas – installation may be close to the edges of the surface.

Follow spacing for TX antenna. Install the antennas in one of the following positions:

- Most preferred for all antennas: centerline of roof. For transmitter antenna, it is the ONLY acceptable position.
- Less preferred for receiver antenna: trunk lid, providing distance to transmitting antenna is respected whether lid is opened or closed.
- Much less preferred, but permissible for receiver antenna: left or right rear fenders, just in back of rear window
- Least preferred, but permissible for receiver antenna: left or right front fenders, ahead of windshield

Note:

Proximity to other vehicle-mounted antennas may cause mutual interference especially at higher frequencies.

The auxiliary receiver antenna must be installed at least 5/8 λ distant from the transceiver antenna.

The GPS antenna placement requires a fairly unobstructed view of the sky. It must also be at least two feet distant from the transceiver antenna but it may be close to the auxiliary RX antenna.

For the optimum antenna spacing at the frequency you are using, consult system engineering.

2.5.3 Antenna Installation

1. Route good quality 50-ohm coaxial cables (e.g. RG-223) from each of the selected antenna positions to the position where the Gemini^{PD} unit is mounted.
2. Terminate the end at each of the antenna positions with the appropriate connector for the antenna used and make the connection.
3. At the Gemini^{PD} position, cut the three cables to length and terminate with the appropriate plug. For the transceiver and the auxiliary cables, use a Mini-UHF crimp plug using an appropriate crimping tool. For the GPS, use a SMA connector.
4. Positively identify the transceiver mini-UHF plug and connect to the left rear of Gemini^{PD}.
5. Positively identify the auxiliary receiver mini-UHF plug and connect to the front left of Gemini^{PD} to the RX position.
6. Connect the SMA connector to the GPS position below the auxiliary connector position.
7. Do not skip this last step, trust us; it is an important one. To complete the installation, tie-wrap together the auxiliary and the GPS antenna cables at a point about two inches in

front of the unit. It will be much easier hereafter to correctly identify which mini-UHF plug goes where. You DO NOT want to cross the auxiliary plug with the transceiver plug.

2.6. Completing the physical Installation.

To complete the physical installation and prior to testing Gemini^{PD}:

- Connect DC Power cable's connector to Gemini^{PD}'s until you hear a click as the two parts snap together.
- Re-check that all other connections are secure (antennas, PC, etc.)
- Switch vehicle ignition ON.

You are now ready to check for normal operation and to run the Radio Installation Software (RIS) program for testing or trouble-shooting.

2.7. Checking out Normal operation

Check that the vehicle ignition is ON.

1- Check for proper operation of the Gemini^{PD}'s LEDs as per Table 1 in section 3.1

2- Using the RIS program (described in section 4) and an in-line wattmeter, check forward & reverse power to confirm main antenna installation.

3- Using the RIS, check the RF link with a base station that can be heard by using the RIS "Ping" feature.
See paragraph 4.4.4.4

or

If user application and its base station are available, test the installation by going through a normal sequence of transmitting and receiving messages.